

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A medical fluid flow system comprising:

a ~~medical fluid therapy~~ blood treatment machine, the machine including ~~a first a blood cleaning device and an on-board pump connected~~ connectable fluidly to a patient;

a controller that controls the flow of a first fluid to and from the ~~first~~ on-board pump and the patient;

a second pump residing externally from the machine, the second pump configured and arranged to pump a second fluid in response to a signal sent by the controller; and

an operator interface in communication with the controller, the interface operable to receive information inputted from an operator and communicate that information to the controller, wherein the controller controls the ~~first~~ on-board and second pumps to pump the first and second fluids using the information.

Claim 2 (original): The system of Claim 1, wherein the controller is integral to the machine.

Claim 3 (original): The system of Claim 1, wherein the operator interface is integral to the machine.

Claim 4 (original): The system of Claim 1, wherein the second pump is configured with a communications device that communicates with the controller.

Claim 5 (original): The system of Claim 4, wherein the communications device is housed integrally with the second pump.

Claim 6 (original): The system of Claim 1, wherein the signal is of a type selected from the group consisting of: a fiber-optic signal, an electrical signal, an analog signal, a digital signal, a radio frequency signal, a microwave signal, an ultrasonic signal, a photo-electric signal, a local area network signal, a wide area network signal, an Internet signal and any combination thereof.

Claim 7 (currently amended): The system of Claim 1, wherein the first fluid is of a type selected from the group consisting of: blood, a substitution fluid, a ~~peritoneal dialysis fluid~~, a dialysis solution, a hemodialysis fluid, an anticoagulant and any combination thereof.

Claim 8 (original): The system of Claim 1, wherein the second fluid is of a type selected from the group consisting of: an electrolyte solution, an intravenous fluid, an anticoagulant, a parenteral nutrition, an enteral nutrition, a fluid via feeding by mouth, a fluid via feeding by tube and any combination thereof.

Claim 9 (original): The system of Claim 1, wherein the machine includes a third pump that pumps a third fluid and is controlled by the controller.

Claim 10 (original): The system of Claim 1, which includes a third pump residing externally from the machine, the third pump configured and arranged to pump a third fluid according to a signal sent by the controller.

Claim 11 (original): The system of Claim 1, wherein the controller comprises a control portion that controls the first and second pumps and an error checking portion that monitors for errors occurring between the control portion and the pumps.

Claim 12 (canceled).

Claim 13 (currently amended): The system of ~~Claim 12~~ Claim 1, wherein the blood cleansing device is selected from the group consisting of: a filter, a dialyzer, a hemofilter, a hemodialyzer, a hemoperfusion cartridge, a hollow fiber plasma separator and any combination thereof.

Claim 14 (original): The system of Claim 1, which includes at least one flow sensing device operable to provide feedback concerning flow of at least one of the first and second fluids to the controller.

Claim 15 (original): The system of Claim 1, wherein the external second pump includes an input device that enables the operator to input information to the controller.

Claims 16 to 23 (canceled).

Claim 24 (withdrawn) A medical fluid therapy method comprising the steps of:

- (a) establishing a communication link between a machine for performing a medical fluid therapy and at least one remote pump controller;
- (b) using the link to synchronize operation of at least one pump housed integrally with the machine with at least one pump located remotely from the machine;
- (c) enabling an operator to enter a net fluid transfer amount; and
- (d) controlling the pumps to substantially achieve the entered amount.

Claim 25 (withdrawn) The medical fluid therapy method of Claim 24, wherein establishing the communication link includes configuring the machine and remoter pump controller for wired/wireless communication.

Claim 26 (withdrawn) The medical fluid therapy method of Claim 24, wherein establishing the communication link includes establishing separate individual links between the machine and a plurality of the remote pump controllers.

Claim 27 (withdrawn) The medical fluid therapy method of Claim 24, wherein synchronization of the operation of the integral and remote pumps includes the step of running one of the pumps depending upon whether the other pump is/is not running.

Claim 28 (withdrawn) The medical fluid therapy method of Claim 24, wherein synchronization of the operation of the integral and remote pumps includes the step of sensing a performance of one of the pumps and adapting control of the other pump based on the sensed performance.

Claim 29 (withdrawn) The medical fluid therapy method of Claim 28, which includes sensing the performance of the one pump intermittently or substantially continuously to adapt the control of the other pump.

Claim 30 (withdrawn) The medical fluid therapy method of Claim 24, wherein controlling the pumps includes the step of accounting for at least one fluid that is inputted into a patient, at least one fluid that is removed from the patient and at least one fluid that is recirculated from and to the patient.

Claim 31 (withdrawn) The medical fluid therapy method of Claim 24, which includes enabling the operator to enter at least one different net fluid transfer amount during the therapy and modifying the controlling of the pumps accordingly.

Claim 32 (withdrawn) The medical fluid therapy method of Claim 24, wherein controlling the pumps includes a step selected from: (i) automatically controlling the external pump based on the entered net fluid transfer amount; and (ii) calculating and displaying a flow value that the operator inputs into the remote pump controller.

Claim 33 (withdrawn) The medical fluid therapy method of Claim 24, wherein controlling the pumps includes the step of monitoring the communication link for error conditions.

Claim 34 (withdrawn) The medical fluid therapy method of Claim 33, wherein the error conditions include communication loss, framing errors, invalid packet format, data errors or any combination thereof.

Claim 35 (withdrawn) The medical fluid therapy method of Claim 24, which includes checking the entered net fluid transfer amount to determine if it is within a safe range.

Claim 36 (withdrawn) The medical fluid therapy method of Claim 24, wherein controlling the pumps includes sending an instruction to at least one of the pumps, the instruction selected from the group consisting of: power on, power off, start, stop, new rate, volume to be infused, clear rate infused, name of drug, concentration of drug and any combination thereof.

Claim 37 (withdrawn) The medical fluid therapy method of Claim 24, wherein controlling the pumps includes receiving a message from at least one of the pumps, the message selected from the group consisting of: channel identifier, channel status, rate dose, volume remaining, infusion label, flow check, primary volume infused, piggyback volume infused, volume history last cleared and any combination thereof.

Claim 38 (withdrawn) A medical fluid therapy method comprising the steps of:

configuring a machine to perform the equation: $\text{filtrate pump rate} = \text{total input rate} - \text{total output rate} + \text{prescribed net loss rate}$, wherein at least one of the total input rate and the total output rate includes a flowrate output of a pump located external to the machine; and
controlling the filtrate pump according to the calculated filtrate pump rate.

Claim 39 (withdrawn) The method of Claim 38, wherein determining at least one of the total input rate and total output rate includes receiving at least one input/output flowrate that has been sensed by a sensor.

Claim 40 (withdrawn) The method of Claim 38, wherein determining at least one of the total input rate and total output rate includes receiving at least one input/output flowrate that has been inputted manually.

Claim 41 (withdrawn) A machine configured and arranged to perform the steps according to Claim 38.

Claims 42 to 44 (canceled).

Claim 45 (withdrawn) A machine configured and arranged to perform the steps according to Claim 42.

Claim 46 (withdrawn) A renal failure therapy method comprising the steps of:
pumping blood through a blood circuit;
infusing citrate as an anticoagulant; and
controlling the citrate flowrate based on the blood flowrate automatically so that the flowrates are synchronized.

Claim 47 (withdrawn) The method of Claim 46, which includes infusing citrate into the blood circuit or directly to the patient.

Claim 48 (withdrawn) The method of Claim 46, which includes additionally controlling citrate to deliver a prescribed amount of citrate.

Claim 49 (withdrawn) The method of Claim 46, which is performed during a treatment selected from the group consisting of: continuous renal replacement therapy, dialysis, hemofiltration and any combination thereof.

Claim 50 (added): A medical fluid flow system comprising:
a blood treatment machine, the machine including a blood cleaning device and an on-board pump connectable fluidly to a patient;
a second pump residing externally from the machine, the second pump configured and arranged to pump a second fluid in response to a signal sent by the machine; and
an operator interface including
a display device, the display device including an input device that enables a person to input a desired net fluid gain/loss, and

a processor in communication with the display device, the processor operable to (i) receive the desired net fluid gain/loss inputted from the device, (ii) monitor flow of the second fluid entering/exiting the patient from/to the second pump, (iii) calculate an actual input/removal flowrate of a first fluid based on the desired net fluid gain/loss inputted from the device and the monitored flow and (iv) command the on-board pump to pump the first fluid at the actual flowrate.

Claim 51 (added) The medical fluid flow system of Claim 50, wherein the input device includes an area of the display device cooperating with a touch screen, the touch screen in communication with the processor.

Claim 52 (added) The medical fluid flow system of Claim 50, wherein the input device is configured to enable the desired net fluid gain/loss amount to be raised/lowered to a desired level.

Claim 53 (added) The medical fluid flow system of Claim 50, wherein the input device includes a toggling device that enables the desired net fluid gain/loss amount to be keyed into the display device.

Claim 54 (added) The medical fluid flow system of Claim 50, wherein the display device includes a display area that displays at least one of: (i) the amount of the net fluid gain/loss inputted from the device; (ii) the monitored flow of at least one of the first and second fluids entering/exiting the patient; and (iii) the actual input/removal flowrate of at least one of the first and second fluids.

Claim 55 (added) The medical fluid flow system of Claim 50, wherein the processor is configured to: (i) update the monitored flow of the second fluid entering/exiting the patient; (ii) recalculate the actual input/removal flowrate of the first fluid; and (iii) change the command to the on-board pump to pump the first fluid at the recalculated actual flowrate.

Claim 56 (added) The medical fluid flow system of Claim 50, wherein the operator interface is attached to the machine.

Claim 57 (added) The medical fluid flow system of Claim 50, wherein the processor is configured and arranged to receive a communication link to communicate with the remotely located second pump.

Claim 58 (added): A medical fluid flow system comprising:

a blood treatment machine, the machine including a blood cleaning device and an on-board pump connectable fluidly to a patient;

a second pump residing externally from the machine, the second pump configured and arranged to pump a second fluid in response to a signal sent by the machine; and

a processor in communication with the display device, the processor operable to (i) perform the equation: $\text{pump rate} = \text{total input rate} - \text{total output rate} + \text{prescribed net loss rate}$, wherein at least one of the total input rate and the total output rate includes a flowrate output of the external second pump and (ii) control the on-board pump according to the calculated pump rate.

Claim 59 (added) The medical fluid flow system of Claim 58, wherein the processor is configured to receive at least one input/output flowrate that has been sensed by a sensor to determine at least one of the total input rate and total output rate.

Claim 60 (added) The medical fluid flow system of Claim 58, wherein the processor is configured to receive at least one manually inputted input/output flowrate to determine at least one of the total input rate and total output rate.